$y-b=m(x-a)$ is the eqn of the line with slope m : 44 through point (a,b)

$(0,1400)$

$y-1400=44(x-0)$

$y=44x+1400$

$y=mx+B$

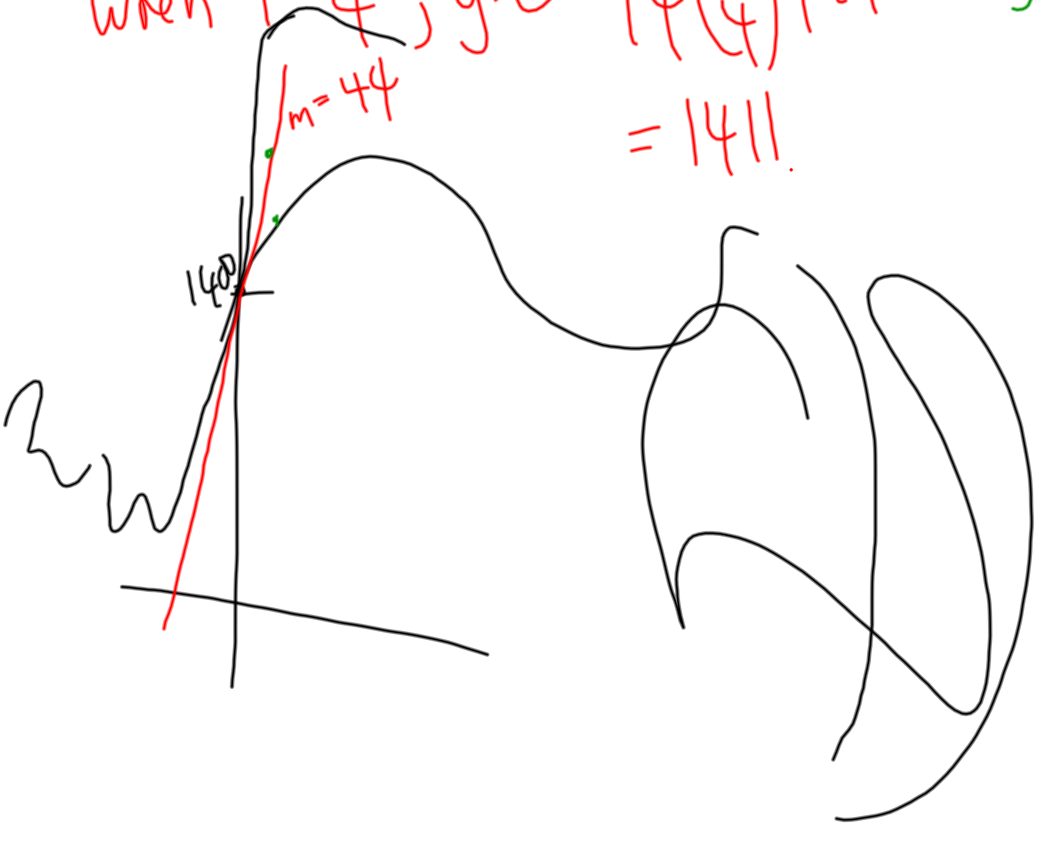
$b=ma+B$

$(b-ma)=B$

$y=mx+(b-ma)$

when $t=\frac{1}{4}$, $y\approx 44\left(\frac{1}{4}\right)+1400$

$=1411$

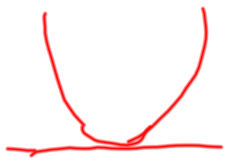


$$\frac{dW}{dt} = \frac{1}{25}(W-300)$$

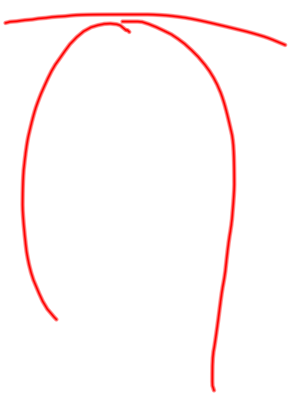
b) find $\frac{d^2W}{dt^2}$ in terms of W

$$\frac{d^2W}{dt^2} = \frac{1}{25}\left(\frac{dW}{dt}\right)$$

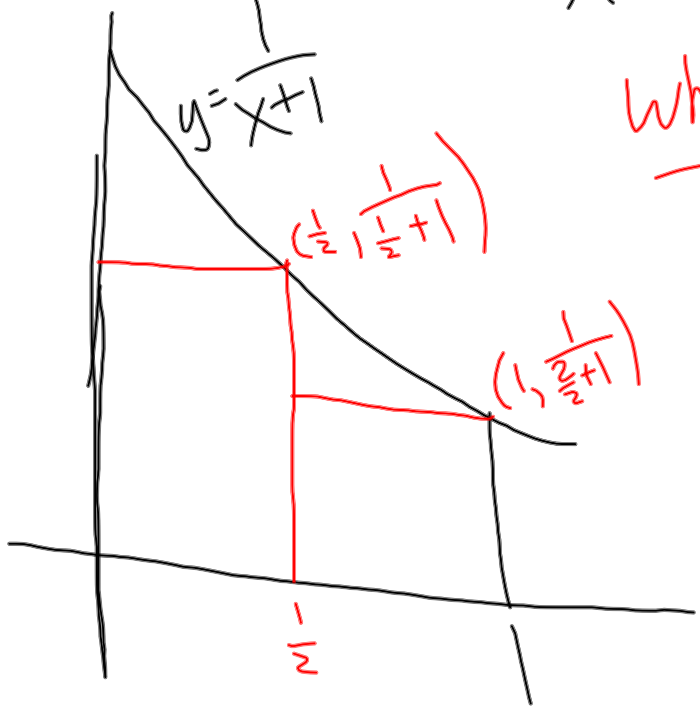
$$\frac{d^2W}{dt^2} = \frac{1}{25}\left(\frac{1}{25}(W-300)\right)$$



How do I use SECOND derivative to determine if tangent line is ABOVE or BELOW the curve?



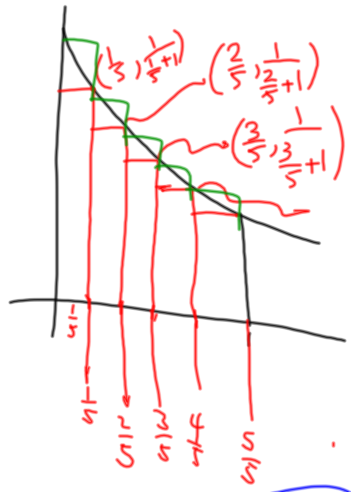
6.1) 2 $\quad f(x)=\frac{1}{x+1}$; $[0,1]$



when $n=2$

$$A=\left(\frac{1}{2}\right)\left(\frac{1}{\frac{1}{2}+1}\right)+\left(\frac{1}{2}\right)\left(\frac{1}{\frac{2}{2}+1}\right)$$

6.1/2 $n=5$



$$A = \frac{1}{5}\left(\frac{1}{\frac{1}{5}+1}\right) + \frac{1}{5}\left(\frac{1}{\frac{2}{5}+1}\right) + \frac{1}{5}\left(\frac{1}{\frac{3}{5}+1}\right) + \frac{1}{5}\left(\frac{1}{\frac{4}{5}+1}\right) + \frac{1}{5}\left(\frac{1}{\frac{5}{5}+1}\right)$$

$$\sum_{K=1}^{5} \frac{1}{5}\left(\frac{1}{\frac{K}{5}+1}\right)$$

$$\text{sum}\left(\text{seq}\left(\frac{1}{5}\left(\frac{1}{\frac{X}{5}+1}\right), X, 1, 5\right)\right)$$

2ND ENTRY

10 10 .646 10

DEL

2ND+DEL = INS

$n=10$

.669

$n=5$, but height of rectangle = f(left side)

$$\sum_{K=0}^{\cancel{5}\,4} \frac{1}{5}\left(\frac{1}{\frac{K}{5}+1}\right)$$

$$\text{sum}\left(\text{seq}\left(\frac{1}{5}\left(\frac{1}{\frac{X}{5}+1}\right), X, 0, \cancel{5}\,4\right)\right)$$

.646

$$\left\{\frac{1}{1}\ \frac{1}{2}\ \frac{1}{3}\ \frac{1}{4}\ \frac{1}{5}\right\}$$

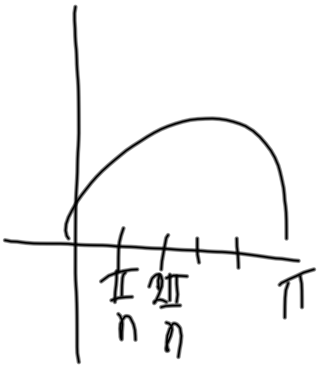
$$\text{SEQ}\left(\frac{1}{X}, X, 1, 5\right)$$

create me a sequence where each term looks like

and the variable is going to change by +1, starting at

and finishing when I wind up

$\sin x \quad [0, \pi]$

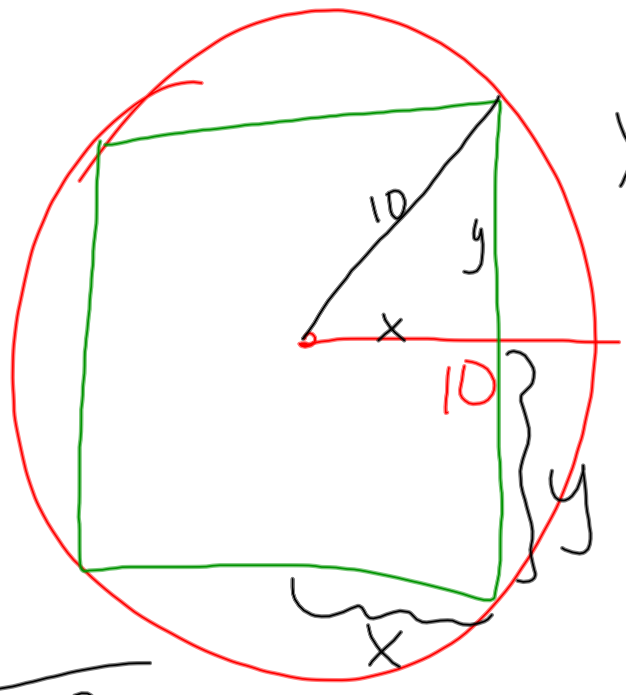


$$\sum_{K=1}^{10} \frac{\pi}{10}\left(\sin\left(\frac{K\pi}{10}\right)\right)$$

$\text{seq}(\quad, K, 1, 10)$

Bye.

~~5.6/9~~



$$x^2+y^2=10^2$$

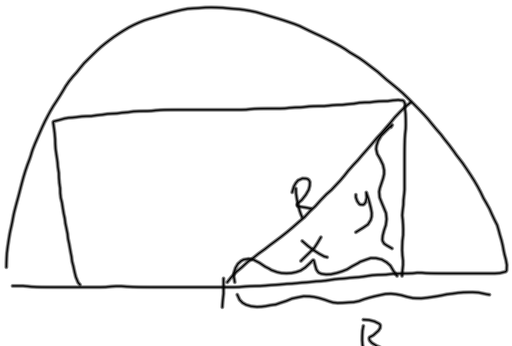
$$y=\sqrt{100-x^2}$$

$$A=(2x)(2y)$$

$$=4xy$$

$$=4x\sqrt{100-x^2}$$

5.6/10



$$A=(2x)y$$
$$=2xy$$

$$x^2+y^2=R^2$$
$$y^2=R^2-x^2$$
$$y=\sqrt{R^2-x^2}$$

$$A=2x\sqrt{R^2-x^2}$$

$$\frac{dA}{dx}=2\sqrt{R^2-x^2}-\frac{4x^2}{\sqrt{R^2-x^2}}$$

$$\frac{dA}{dx}=\frac{2\sqrt{R^2-x^2}\sqrt{R^2-x^2}}{\sqrt{R^2-x^2}}-\frac{4x^2}{\sqrt{R^2-x^2}}$$

$$\frac{dA}{dx}=\frac{2(R^2-x^2)-4x^2}{\sqrt{R^2-x^2}}$$

$=0$ when

und?

$x=R$

$$2R^2-2x^2-4x^2=0$$
$$2R^2-6x^2=0$$
$$x=\pm\sqrt{\tfrac{1}{3}}R$$

$$\frac{dW}{dt} = \frac{1}{25}(W - 300)$$

$$m = \frac{dW}{dt} \text{ at } \begin{pmatrix} t=0 \\ W=1400 \end{pmatrix} = \frac{1}{25}(1400-300)$$

$$= \frac{1100}{25} = 44$$

$$Pt = (0, 1400)$$

tangent line

$$y - 1400 = 44(\cancel{x} - 0)$$

$$y = 44\cancel{x} + 1400$$

use when $t = \frac{1}{4}$

$$y = 44\left(\frac{1}{4}\right) + 1400$$

$$= 11 + 1400 =$$

1411 tons

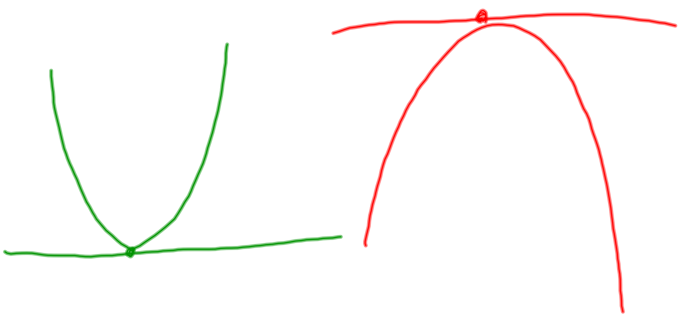
b) $$\frac{dW}{dt} = \frac{1}{25}(W - 300)$$

$$\frac{dW}{dt} = \frac{1}{25}W - 12$$

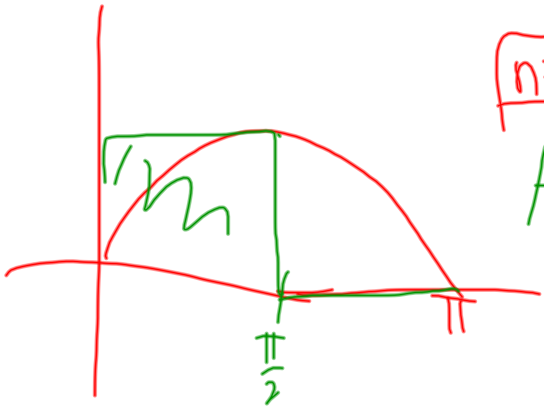
$$\frac{d^2W}{dt^2} = \frac{1}{25}\left(\frac{dW}{dt}\right)$$

$$\frac{d^2W}{dt^2} = \frac{1}{25}\left(\frac{1}{25}(W-300)\right)$$

How does the second derivative tell me if tangent line is ABOVE or BELOW the curve?



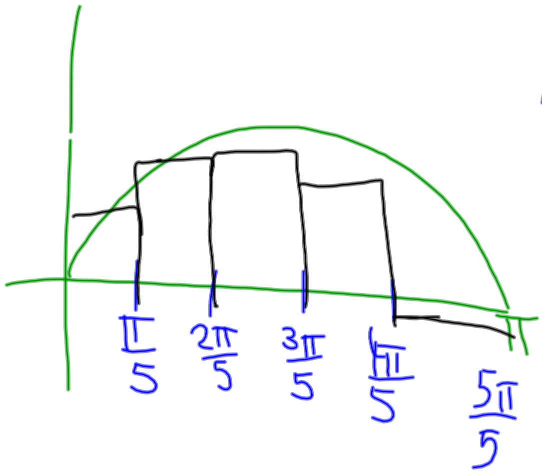
6.1/3) $f(x) = \sin x \quad [0, \pi]$



$\boxed{n=2}$

$$A = \left(\frac{\pi}{2}\right)\sin\frac{\pi}{2} + \left(\frac{\pi}{2}\right)\sin\frac{2\pi}{2}$$

$$= \frac{\pi}{2}$$



$$A = \left(\frac{\pi}{5}\right)\left(\sin\left(\frac{1\pi}{5}\right)\right) + \left(\frac{\pi}{5}\right)\left(\sin\left(\frac{2\pi}{5}\right)\right) + \left(\frac{\pi}{5}\right)\left(\sin\left(\frac{3\pi}{5}\right)\right) + \left(\frac{\pi}{5}\right)\left(\sin\left(\frac{4\pi}{5}\right)\right) + \left(\frac{\pi}{5}\right)\left(\sin\left(\frac{5\pi}{5}\right)\right)$$

$$\sum_{Q=1}^{5}\left(\frac{\pi}{5}\right)\left(\sin\left(\frac{Q\pi}{5}\right)\right)$$

$$\text{sum}\left(\text{seq}\left(\left(\frac{\pi}{5}\right)\left(\sin\frac{X\pi}{5}\right), X, 1, 5\right)\right)$$

add up all the terms in the sequence. what seq? see

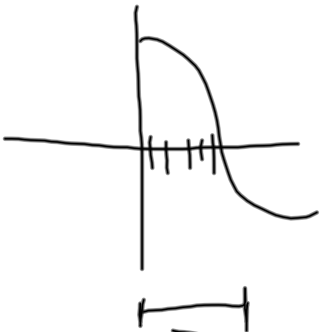
create me a sequence based on this pattern

where this changes

starting with and going up by 1

until I'm done

④ $\cos(x)$ $[0, \pi/2]$



$\frac{\pi}{2}$

$2 = n$

$$\left(\frac{\pi}{4}\right)\left(\cos\left(\frac{\pi}{4}\right)\right) + \left(\frac{\pi}{4}\right)\left(\cos\left(\frac{2\pi}{4}\right)\right)$$

$5 = n$

$$\left(\frac{\pi}{10}\right)\left(\cos\left(\frac{\pi}{10}\right)\right) + \left(\frac{\pi}{10}\right)\left(\cos\left(\frac{2\pi}{10}\right)\right)$$

$$\left(\frac{\pi}{10}\right)\left(\cos\left(\frac{3\pi}{10}\right)\right) \ldots \left(\frac{\pi}{10}\right)\left(\cos\left(\frac{5\pi}{10}\right)\right)$$

$10 = n$

$$\left(\frac{\pi}{20}\right)\left(\cos\left(\frac{\pi}{20}\right)\right) + \left(\frac{\pi}{20}\right)\left(\cos\left(\frac{2\pi}{20}\right)\right)$$

$$\left(\frac{\pi}{20}\right)\left(\cos\left(\frac{3\pi}{20}\right)\right) \ldots \left(\frac{\pi}{20}\right)\left(\cos\left(\frac{10\pi}{20}\right)\right)$$

$.9194$